

- e. If continuity is not established then the ILEC together with the CLEC must troubleshoot the daisy chain of tie-pair cables and cross-connect wires until proper continuity is restored.
- f. Upon confirmation of (or restoration of) continuity, changes on the customer's line need to be made in the switch software via the "recent change" process (discussed infra at Section IV.B.2), to establish the customer as a CLEC UNE-customer for usage and billing purposes and for making any needed changes to the features or functions (e.g., customized routing for OS/DA) that are now to be associated with that line.

36. In a typical virtual collocation scenario, the above scenario changes in one notable respect. With virtual collocation, the ILEC has complete control over the CLEC frame and performs the recombining of the elements on behalf of the CLEC. The ILEC would therefore need independently to engineer the entire connection, make all of the block assignments, and so forth. At least in theory, the ILEC could reasonably be expected to pre-wire as much of the circuit as possible, thereby minimizing the time of service outage.

37. The above scenarios assume maximum ILEC/CLEC cooperation within the constraints imposed by physical collocation. Of course, since BellSouth (and other RBOCs proposing collocation) have not set forth the methods and procedures they would accept for such recombination, I do not know whether BellSouth would agree to use such procedures. The important point for purposes of assessing BellSouth's application for Louisiana, however, is that even putting the best face on it, manual recombination through

collocation is not a competitively viable way to make unbundled loops and switching available for recombination. The reasons for this are set forth in the next section.

**III. OBSTACLES TO COMPETITION INHERENT IN MANUAL RECOMBINATION OF UNBUNDLED LOOP AND SWITCH ELEMENTS VIA COLLOCATION**

38. Even under the best of circumstances, the manual reconnection of the loop and switch via collocation through the manual process described above is so cumbersome and inefficient that it prevents CLECs from gaining access to the unbundled loop and switch in a manner that would permit effective competition. In particular, that approach imposes four serious obstacles to effective competition:

- (A) it requires that the customer's line be taken completely out of service and creates a substantial risk of an extended outage;
- (B) it will prevent CLECs from using the loop/switch combination (1) to service any customers soon; (2) to ever serve competitively significant numbers of customers; and (3) to serve some customers (e.g., those on IDLC) at all;
- (C) it will impose service on CLEC customers that is inferior to what ILEC customers receive; and

- (D) it will impose excessive and entirely unnecessary costs that would alone effectively foreclose competition via loop/switch combinations with incumbents (who will not incur such costs) for most, if not all customers.

I will discuss each of these obstacles to competition in turn.

**A. Loss of Service During Cutover**

39. In the physical collocation approach, there is no escaping the problem of placing the customer out-of-service for some period of time in order to disconnect and then reconnect the service. In the best-case scenario described above, pre-wiring by the CLEC and ILEC reduces the time that the customer is without service to the time it takes to perform a "hot cut" -- that is, disconnect both ends of a cross-connect and cut on the two new cross-connections, without having previously removed the dial tone at the switch. In addition, in the best case scenario, an ILEC would establish methods and procedures to ensure that each hot cut is performed correctly by an experienced crew, so that the amount of time the customer would be kept out of service would be minimized.

40. There is significant room for discretion, even within the parameters of a "hot cut," to perform the procedure with greater or lesser impact on the customer. For example, the technicians should check in advance of the cutover to make sure that there was no active call on the line. Similarly, the sequence for disconnecting and reconnecting each terminal that the technicians follow will affect the amount of time that the customer's service is interrupted. And, because two cross-connections must be made to provision any one customer with an unbundled loop and switch, the number of technicians that the incumbent

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LEC uses to provision each order will also affect the amount of customer downtime. It would therefore be essential to establish appropriate methods and procedures governing these and related aspects of loop/switch provisioning, in order to minimize the disruptiveness of the cutover process to the customer and to the CLEC's ability to compete.

41. If the assumptions underlying the best-case scenario do not hold, however, then the chances for a prolonged outage increase. Indeed, there are many reasons why the time for a cutover could increase substantially.

42. For example, the best case scenario assumes that the ILEC is willing and able to adhere to procedures that require complete pre-wiring to the point that the new cross-connections are tied down on the blocks ready to be cut-over (as is typically done with collocation hot-cut arrangements). If any of the pre-wiring is not completed, then the customer likely will be out of service will significantly increase. If no pre-wiring is done, the time out-of-service will be quite substantial, for at least two individual disconnect/reconnect procedures (two each at the MDF) would need to be completed; an additional two at the IDF, if that is used, would only further increase customer outage time.

43. An even longer outage could occur if the pre-wiring is not done correctly. Examples of predictable errors would include misidentified block assignments or cable and pair numbers, or defective connections, or assignments not spare.<sup>10</sup> Given the difficulty of maintaining completely accurate and parallel ILEC/CLEC inventories of all

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<sup>10</sup> An "assignment not spare" occurs when a technician is given a correct block assignment but nevertheless discovers on the job that the terminal is occupied by another wire that was mistakenly not removed during a previous job.

block assignment and frame locations, and the numerous points of potential failure on the collocation circuit, the chances of such problems occurring must be considered substantial.<sup>11</sup>

Notably, the chances for error are higher than with simple provisioning of unbundled loops, because provisioning the loop/switch combination requires twice as many cross-connections as is required simply to roll a single loop for a CLEC to combine with its own switch (that is, two cross-connects instead of one, assuming no IDF, or four instead of two, with an IDF).

44. The best-case scenario also assumes that ILECs will devote the substantial resources -- e.g. overnight shifts of experienced frame technicians -- needed to minimize customer service interruption. It is doubtful, however, that ILECs will be able consistently to make such resources available to meet the demands of CLECs in a competitive market.

45. Finally, the best case scenario makes a number of critical assumptions about methods and procedures that have yet to be established. For example, a BOC could make it impossible for a CLEC to prewire the connections in its collocation space simply by refusing to let the CLEC identify the terminals on the CLEC connector blocks at the MDF to which the new customers should be assigned. In this scenario, the ILEC would wait until it came time to provision the customer, disconnect the customer, reconnect the customer to the CLEC's connector blocks at the MDF, and only then tell the CLEC the connector block

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<sup>11</sup> In such circumstances, the outage might be minimized if the ILEC technicians restored the customer's former cross-connect while the repair work is ongoing, but here again the CLEC would be dependent upon the ILEC to follow such procedures.

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assignments. This approach would compel the CLEC to have a technician stationed in its collocated space during the cutover, for only then would the CLEC have the information it needed to lay in the cross-connection for that customer and complete the circuit. Even putting every other consideration to one side, the burden that eliminating pre-wiring would place on CLECs and their customers would be so great that no CLEC would accept it. This scenario is worth noting, however, because it illustrates the enormous impact that one seemingly small procedural issue -- who selects connector block assignments -- can have enormous practical consequences.

46. To date, however, even in the relatively simpler world of "pure" loop unbundled loop provisioning (where only one disconnect/new connect need occur in a hot cut), it is clear that CLEC customers have been subjected to substantial service outages. Far from quickly cutting over service in the dead of night, ILECs have frequently left new CLEC customers without service for hours at a time in mid-day.

47. Carriers in BellSouth's region, for example, have complained about excessive customer outages during cutover. ACSI, for example, has reported cutover outages routinely exceeding four hours. The competitive impacts of such outages are immense: "BellSouth's inability to avoid lengthy disconnections during the customer cutover process jeopardized ACSI's ability to retain existing customers and to attract new customers to its service. ACSI cannot compete with BellSouth if its customers must endure service

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outages routinely exceeding 4 hours -- or if ACSI is made to appear unable to switch a customer to its service.<sup>12</sup>

48. According to WorldCom, which has experienced three-to-four hour delays during cutovers of large business customers, "BellSouth coordinated cutovers are anything but."<sup>13</sup> WorldCom customers have been out of service "an unacceptably long time" during cutovers, with delays caused by "limits on the number of cutovers that [BellSouth] will perform and the hours in which it will perform them."<sup>14</sup> Moreover, Sprint has reported "problems in virtually all phases of the customer activation (or 'cutover') process for unbundled loops," leading it to file a formal complaint with the Florida PSC.<sup>15</sup> Indeed, on one occasion, when BellSouth repeatedly issued internal orders for an unbundled loop incorrectly, a customer experienced an eighteen day installation interval.<sup>16</sup> In other instances, "BellSouth has spent months sorting out problems with its cutover process before

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<sup>12</sup> ACSI Comments, In the Matter of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina, Affidavit of James C. Falvey, ¶ 34, CC Docket No. 97-208 (Oct. 20, 1997).

<sup>13</sup> WorldCom Comments, In the Matter of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina, Ball Affidavit, ¶ 18, CC Docket No. 97-208 (Oct. 20, 1997).

<sup>14</sup> Ibid.

<sup>15</sup> Sprint Comments, In the Matter of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina, pp. 16-17 and Closz Affidavit, ¶¶ 65-84, CC Docket No. 97-208 (Oct. 20, 1997).

<sup>16</sup> Sprint Comments, Closz Aff., ¶ 79.

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Sprint's local customer received service from Sprint."<sup>17</sup> Such cutover problems are not unique to BellSouth.<sup>18</sup>

49. BellSouth concedes that it has experienced a number of problems in provisioning unbundled loops, contending that such problems are an inevitable by-product of "any complex offering such as unbundled loops." Milner Aff., ¶¶ 46-50. Although BellSouth predictably claims that it has resolved its loop provisioning problems, even if true this assertion provides no solace. In light of BellSouth's past performance, there is every reason to expect that the substantially more "complex" process of combining loops and switch ports via collocation will spawn even greater cutover problems.

50. The potential impact of mandatory, unpredictable, and potentially extended service outages on the prospects for local competition cannot be overstated. Customers will be alarmed at the prospect of any service outage, and will not tolerate any prospect of an outage for more than a negligible period of time. Indeed, the service outage necessitated by the ILEC proposal will, by itself, be a severe impediment to a CLEC's ability to compete effectively.

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<sup>17</sup> Sprint Comments at 17.

<sup>18</sup> See also Comments of Brooks Fiber, In the Matter of Application by Ameritech Michigan for Authorization Under Section 271 of the Communications Act to Provide In-Region, InterLATA Service in the State of Michigan, pp. 30-31 and Exhibit M, CC Docket No. 97-137 (June 10, 1997) (detailing Ameritech's "poor coordination of customer cutovers"); Hearing Transcript, In re Implementation of the Telecommunications Act of 1996; Bell Atlantic-Pennsylvania's Entry into In-Region, InterLATA Services Under Section 271, pp. 36, 107-111, 138-141, PA PUC Docket No. M-960840 (April 3, 1997) (NEXTLINK testimony describing Bell Atlantic's "atrocious" performance in cutting over loops).

**B. "Gated" Market Entry -- Inherent Provisioning Limits**

51. Quite apart from the customer impact of losing service is the series of obstacles that arise from the inherent limits on provisioning the combination of loop and switch elements using collocation. These obstacles are inherent in the nature of the collocation process because the time needed to construct collocation cages will delay any market entry, and because the architecture of the MDF imposes limits on the number of customers that can be provisioned in a given day. As a result, the number of customers a CLEC actually could serve using unbundled loop and switch combinations would be only a fraction of the customers the CLEC otherwise could win. In contrast, when an ILEC enters the long distance market, it will be practically unbounded in its ability to absorb new long distance customers through the time-tested electronic PIC process.

**1. Limits In Establishing Collocation Space**

52. The first limit arises from the need to establish collocated space -- either physical or virtual -- in every central office that a CLEC wishes to serve. The limited collocation that CLECs have pursued to date has typically involved only a relatively few central offices in a few parts of a state. For a CLEC like AT&T that wishes to use the combined unbundled loop and switch to offer business and residential service throughout a state, the demand for collocated space would be much greater.

53. At the outset, it is not clear how many switch locations will have space available for physical collocation of a CLEC's frame and cabling equipment. Even at those locations that can accommodate physical collocation of the CLEC's frame, it is not clear

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whether there will be sufficient space in existing cable racks and risers for all the additional tie cables that would be needed to connect the CLEC's equipment to the MDF, or that there would be sufficient space at the MDF to install the additional blocks that would be needed to terminate these tie cables. If any of these constraints existed at a particular central office, it would likely add considerably to the time and expense of establishing the collocation arrangements that must be completed before a CLEC could begin to offer service to any customers from that central office.

54. The extent of the problems in establishing collocated space in Louisiana at this point is unknown. In Louisiana, for example, there are more than 200 locations (including central offices and remote switching locations) at which collocated space would be needed in order to compete for all of BellSouth's customers. But to date, BellSouth has completed only one physical collocation arrangement and four virtual collocation arrangements in Louisiana. Milner Aff., ¶¶ 23, 29-30. Compounding the uncertainty is the fact that BellSouth has projected a wide range of intervals for establishing collocated space, from 5 to as many as 11 months. And BellSouth has not made clear whether its projected intervals take into account the kinds of capacity constraints (e.g., at the MDF, cable racks and risers), that could arise if demand for collocated space significantly increases.

55. Thus, BellSouth has not demonstrated that it could maintain its projected intervals if faced with demand for such space that was many times what it has faced to date. The projections of other ILECs suggest, moreover, that further delays will result. For example, Bell Atlantic-New York ("BA-NY") recently testified before the New York Public Service Commission that there are significant limits to the number of collocation

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requests that it can handle at any one time. Although there are more than 500 central office and remote switch locations in BA-NY's territory, BA-NY claims to be able to handle only 15-20 collocation requests per month statewide, and no more than 8 applications total per month in any one of its five designated geographic regions within the state.<sup>19</sup>

56. The above projections -- based on ILEC estimates of what they could do -- are likely more optimistic than what could be expected to occur in practice. As with cutovers, the process of establishing collocated space is vulnerable to delay from multiple sources. Delay is virtually inevitable until the terms and conditions of collocation are established in detail, not only in a contractual agreement between an ILEC and a requesting CLEC, but in actual experience. In California, for example, Pacific Bell has delayed provisioning time substantially by declining to provide any date for responding to AT&T's inquiries regarding collocation, insisting that AT&T conduct end-office specific negotiations with PacBell employees that varied from end office to end office, and determining (three months into the process) that changes were necessary to the power arrangements requiring re-engineering of the requested space.

57. CLECs are already encountering these problems with BellSouth. For example, BellSouth already has insisted on building collocated space with gypsum-board walls rather than wire mesh, an unnecessary requirement that serves only to prolong

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<sup>19</sup> Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Condition Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996, NY PSC Docket No. 97-C-0271, Affidavit of Karen Maguire, ¶ 20 ("Maguire Aff.") (excerpt attached as Attachment 10).

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construction time and increase cost.<sup>20</sup> Indeed, ITC DeltaCom has estimated that construction costs of the fully-walled collocation cages required by BellSouth will run \$300.00 per square foot and that the cost to construct such space in three central offices in Georgia is over \$300,000.<sup>21</sup> Moreover, the BellSouth negotiation process has itself been a source of significant delay. It took ITC DeltaCom several months to negotiate a collocation contract with BellSouth, because the BellSouth representative "assigned the task a low priority," "provided little or no response to DeltaCom's requested changes," and "slow[ed] down the negotiation process completely."<sup>22</sup> And there are yet other sources of potential delay -- such as a limitation on the availability of certified, technically proficient vendors -- that may be outside of both the BOC's and the CLEC's control.<sup>23</sup>

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<sup>20</sup> See, e.g., BellSouth Barrier and Enclosure Wall Specifications, Louisiana PSC Docket Nos. U222022/U22093, appended to BellSouth Application at App. C-3, Vol. 33b, Tab 272(9); ALTS Comments, In the Matter of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina, Affidavit of Steven D. Moses on behalf of ITC DeltaCom, Attachment C, ¶ 19, CC Docket No. 97-208 (Oct. 20, 1997) ("ITC DeltaCom Aff."). Wire mesh is preferable to drywall because it is far cheaper and quicker to install, improves visibility and thus enhances security, and eliminates the need for additional or new air conditioning capacity, dust protection measures during construction. See Direct Testimony of Gerald B. Crockett on behalf of MCI/AT&T, Louisiana PSC Docket Nos. U222022/U22093, appended to BellSouth Application at App. C-3, Vol. 33b, Tab 272(8), pp. 7-12.

<sup>21</sup> ITC DeltaCom Aff., ¶ 19.

<sup>22</sup> ITC DeltaCom Aff., ¶ 19.

<sup>23</sup> BA-NY recently noted that there are "only two vendors that are qualified and willing to provide central office power engineering and installation" and that this could limit BA-NY's "capacity to provide physical and virtual collocation arrangements on demand." Maguire Aff. ¶ 19. See also ITC DeltaCom Aff., ¶ 19 ("DeltaCom has been unable to have its [equipment] installers certified" by BellSouth.")

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58. BellSouth has not provided projections of how long it would take to establish collocation space for even one CLEC in all of its central offices in Louisiana. Indeed, its position appears to be similar to Pacific Bell's -- that each collocation space arrangement is unique and must be negotiated individually. But given BellSouth's relative inexperience with collocation in Louisiana, substantial delays seem likely.

59. Indeed, BellSouth has already compiled a record of delay in completing collocation orders. Under the MCI/BellSouth Interconnection Agreement, BellSouth must provide MCI collocation within 90 days of a firm order. In April 1997, MCI placed four firm orders for collocation, but as of October 22, 1997, all four orders remained pending.<sup>24</sup> Furthermore, in attempting to implement its collocation agreements in Miami, WorldCom has experienced "delays, missed dates, surprise changes, and more delays."<sup>25</sup> Thus, as the Florida PSC found in declining to approve BellSouth's petition for interLATA authority, "BellSouth's inability to establish physical collocations in a timely manner is still a problem which has a direct affect on the [CLECs'] ability to compete meaningfully in the marketplace."<sup>26</sup>

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<sup>24</sup> Memorandum of Fla. PSC Staff, Docket No. 960786-TL, Consideration of BellSouth Telecommunications, Inc.'s Entry into InterLATA Services Pursuant to Section 271 of the Federal Telecommunications Act of 1996, p. 70 (Oct. 22, 1997) ("FPSC Staff Mem."), aff'd in relevant part, Florida PSC, Order No. PSC-97-1459-FOF-TL (Nov. 19, 1997).

<sup>25</sup> In re: Consideration of BellSouth Telecommunications Inc.'s Entry into InterLATA Services Pursuant to Section 271 of the Federal Telecommunications Act of 1996, Fla. PSC Order No. PSC-97-1459-FOF-TL, p. 48 (Nov. 19, 1997) (quoting WorldCom testimony).

<sup>26</sup> Id., at 58.

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60. By requiring collocation as a condition precedent to a CLEC obtaining combination of the loop and switching elements, BellSouth imposes on every CLEC seeking to use these UNEs in combination another layer of negotiation, expense and unpredictable delay. These added costs of entry will inevitably winnow further the number of CLECs who can marshal adequate resources to enter the Louisiana market. Moreover, those CLECs who are able to navigate the collocation application and installation process will, at the end of the day -- and several months later than necessary -- merely be positioned to begin the provisioning of service to customers.

**2. Limits In Cutting Over Customers**

61. A second source of market entry delay is the manual work needed to establish the cross-connection on the MDF (and possibly the IDF). This would involve two basic steps that would typically be performed by a team of three technicians: one person working on the line side of the frame, one on the switch side, and a third who coordinates their activity, e.g., by calling out assignments and block appearances on the frame. First, the team would connect the connector block containing the loop appearance to the connector block containing the tie-cable to the CLEC's collocated frame. Second, the team would connect the connector block containing the tie-cable coming from the collocated frame to the connector block containing the switch port. See Figure 6 (Attachment 11). This wiring must be done on a customer-by-customer basis which limits the number of customers that could be provisioned with UNE service in any one day.

62. Although no ILEC has direct experience with provisioning loop/switch combinations, a consultant retained by BA-NY has estimated that the maximum number of

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loop/switch combination orders that a BOC could provision in a single large central office per day is 143.<sup>27</sup> Considering that a typical central office in a large urban area may serve over 200,000 lines, this in itself is an insufficient number to support meaningful UNE-based competition. More importantly, however, it is an unrealistically high estimate, for several reasons.

63. First, the estimate assumes that three shifts of two technicians teams are available to work around the clock.<sup>28</sup> While that might be possible to achieve for a short period of time at one urban central office, in my experience BOCs typically do not have idle qualified technicians available for reassignment to such projects for extended periods of time. Indeed, at many suburban and virtually all rural central offices, there are no frame technicians on site as a regular matter at any time, because the offices are unmanned. At those offices, one shift of 1 to 3 technicians would mark a significant event; three shifts of two technician teams would rarely, if ever, occur. Thus, it is unreasonable to assume that any ILEC has sufficient resources to staff 2 full teams of experienced frame technicians around the clock, except at best, for brief periods in selected offices.

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<sup>27</sup> Petition of New York Telephone Company for Approval of its Statement of Generally Available Terms and Condition Pursuant to Section 252 of the Telecommunications Act of 1996 and Draft Filing of Petition for InterLATA Entry Pursuant to Section 271 of the Telecommunications Act of 1996, NY PSC Docket No. 97-C-0271, Affidavit of Gerard Mulcahy, Att. 1, pp. 16-17 ("Mulcahy Aff."). In addition to the assumptions discussed in the text, this consultant's analysis assumes that no more than two teams of three to four technicians each can work on a single frame during any single shift. A limit of two teams of three technicians per shift would be a reasonable assumption in my experience, for adding any more than six people to work on a frame at one time results in the law of diminishing returns, slowing down the progress that any individual team is able to make.

<sup>28</sup> Mulcahy Aff., Att. 1, p. 16.

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64. Second, the BA-NY consultant's estimate assumes that no frame work would need to be done for the ILEC's purposes. That, too, is unrealistic. Because a maximum of two teams of people can work on an MDF at any one time, a realistic estimate would have to take into account the non-CLEC related frame work that may need to be completed as well.

65. Third, in every case where ILEC technicians install new wires on the MDF to accomplish a recombination of a loop and port for an existing customer, the technicians will also have to perform a separate job (or jobs) to disconnect and remove (or "mine") the existing wires from the MDF. Thus, each loop-port recombination will require at least three (and possibly four) job orders for ILEC technicians at the MDF, which could significantly reduce the number of customers who could actually be moved to a loop-port combination.

66. Fourth, the BA-NY consultant's analysis fails to consider that additional time will be needed to coordinate the two cross-connect jobs BA-NY's technicians will have to perform when a CLEC provides service using a BA-NY loop and switch port. New methods and procedures (M&Ps) would plainly be required to handle such coordinated cross-connect orders. Based on my experience, it is reasonable to expect that implementation of these M&Ps will increase the time ILEC technicians need to perform a cutover, especially in the early stages of work, thus further reducing the number of lines an ILEC could cutover to a CLEC in a day.

67. Fifth, the estimate does not directly translate into a number of new CLEC customers per day because it does not take customer churn into account. Thus, the

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daily limit on orders, whatever it may be (and it is surely far less than 143), is a limit not simply for new loop/switch customers but for the wiring necessary to switch customers between CLECs or from CLECs back to the ILEC. Given that a number of CLECs, including AT&T, WorldCom, LCI, MCI, and Sprint, have all expressed interest in serving customers with loop/switch combinations, and that other CLECs can be expected to order unbundled loops, it is plain that the number of new customers that can be added at a large central office per day is a small fraction of 143.

68. Finally, the estimates do not take into account provisioning delays resulting from human error. It seems plain, however, that the potential for error in provisioning the loop/switch combination through collocation is substantial. Most notably, proper wiring is vitally dependent on the accuracy and consistency of the inventories that the CLECs and ILEC would each need to keep, but would keep separately. In the absence of extensive inter-company coordination to keep and maintain mutually consistent databases of these records, it is inevitable that inconsistencies will emerge that will further delay or cause errors in provisioning.

69. The limits that this manual work places on the number of CLEC customers that can be provisioned on any given day translates directly into restrictions on the ability of a CLEC to market its services. CLECs would not be able confidently to engage in mass marketing through, for example, radio, television, and print advertisements, for that likely would lead to demand at a given central office far beyond what the ILEC could provision. The Commission has observed, in discussing nondiscriminatory access to an incumbent LEC's operations support systems, that ILECs must be able to handle "the order

volumes and fluctuations reasonably expected in a competitive marketplace," particularly during the early stages of competitive entry when "order volumes" will "be relatively volatile." Ameritech Michigan Order ¶ 199. The same is true here. Manual recombination would so gate entry that CLECs would likely be forced to market only through controlled outbound telemarketing or direct mail, so that marketing could be shut down once capacity limits at individual central offices were met. This is not a recipe for meaningful local competition.

**3. Limits To Physically Separating IDLC Loops**

70. Because the IDLC terminates directly into the switch without any physical loop termination on an MDF, the concept of an IDLC loop is fundamentally incompatible with BellSouth's proposed connection of loop and switch through collocation. IDLC loops cannot be manually disconnected from the switch on a customer-by-customer basis in the way copper loops can be. As a result, to separate an IDLC loop from switching in a manner that would comply with BellSouth's proposed collocation requirement would relegate CLECs to methods that are rarely available, impractical, and typically involve significant degradation of the customer's service.

71. The first method to do so is to disconnect the copper loop distribution (e.g., at the IDLC remote terminal) and then reconnect the loop onto a spare analog loop pair. This solution is only possible where a spare analog loop that meets loop technical requirements can be found in the vicinity of the customer. While no spare loop would be likely in a new development that was provisioned with IDLC from the outset, there may be spare loops in older areas where an ILEC has replaced copper loops with IDLC. If,

however, such loops were abandoned for an upgrade to IDLC technology, chances are they are of poor quality, and the CLEC customer that is moved off of state-of-the-art IDLC onto the old analog loop plant may immediately experience a degradation of service quality. To a CLEC struggling to establish consumer confidence, the consequences of imposing such degraded service (or even the risk of such degradation) on its new customers are very serious. Furthermore, this method could impose additional costs and delay if the ILEC's switch did not have sufficient analog line cards to support conversion of these formerly digital loops to analog loops.

72. The second method is either to move the customer's line to a parallel universal digital loop carrier system (UDLC) or to convert the entire IDLC system to a UDLC system. This older version of digital loop carrier equipment converts the loops back to an analog service in the central office thereby allowing an individual customer's line to be accessed at the MDF. This digital-to-analog conversion, however, may degrade the quality of service for the customers involved. Also, converting the entire IDLC system to a UDLC system, while technically possible, logically makes no sense from an economic or service-quality perspective, since ILEC loops would be converted as well.

73. Because of the lack of any readily available, economical, reliable, and competitively equivalent means for physically separating IDLC loops, BellSouth's insistence on physical collocation is unworkable and anticompetitive. It effectively seals off from competition that portion of BellSouth's customers that BellSouth chooses to serve via IDLC loops.

74. Use of these methods (and acceptance of the associated degradation in service quality) may be necessary in order to roll a loop to a competitor's switch. But they are not necessary when the competitor seeks to combine the IDLC loop with the incumbent's local switching element. As explained in Part IV below, they can be logically separated from, and connected to, the ILEC's switching element using an electronic means of recombination. Given the inherently discriminatory nature of combining IDLC loops and switching via collocation, access to this electronic means of combining these elements will be essential if CLECs are to be able to compete for customers served by IDLC loops.

**4. Limits To Collocating at Remote Switching Modules**

75. The problems of combining the loop and switch port through collocation are heightened by BellSouth's extensive use of remote switch modules. When a remote switch module is employed, the local loop terminates not at the MDF in the central office but at a frame located at this remote site, which is located a significant distance from the central office that houses the host switch. The remote switch module and associated support equipment. Consequently, collocating equipment for the purpose of recombining loops with switches poses a severe logistical problem due to the lack of space. In Louisiana, BellSouth has 117 active remote switch modules, which are each designed to serve 2,000 customers. Therefore, even assuming that these switch modules are only operating at 50% capacity, BellSouth's collocation requirement would potentially insulate over 100,000 customers from competition.

**C. Inherently Inferior Service Quality**

76. BellSouth's collocation requirement will lead to inherently inferior service quality for CLECs who recombine the unbundled loop and switch port. The wire used on the MDF typically is only 22 gauge, which means that the wires themselves are approximately the diameter of pencil lead. Such thin wires are inherently frail. Moreover, many of the wires connecting loops and switch ports have been in place for many years. A collocation requirement entails unnecessary handling and removing of these wires as customers change local service providers. As significant competition develops and customers begin to churn, the continual activity and increased congestion on the frame caused by installing new cross-connects and removing the old cross-connects will put an unnecessary stress on the frames' jumpers, at times causing a connection to inadvertently break. See Attachment 4.

77. The impact of the increased strain on the frame and resultant service failures will be borne disproportionately by CLECs, because recombination by collocation will double the number of cross-connections on the MDF frame for CLEC loops compared to ILEC loops. See Figure 6 (Attachment 11). Jumpers in a frame (especially the MDF) are already subject to significant pulling and tugging as technicians move other jumpers across or around the frame, or "mine" out old wires that are no longer being used. See Attachment 4. As this pulling and tugging increases with competitive activity, so too will CLECs' service failures.

78. Further, a typical BellSouth loop connection in a wire center has only two points of connection to a frame -- one on the terminal connecting to the loop, and the

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other on the terminal making the connection to the switch port. These points of connection are "points of failure," because they are places where the loop connection is most likely to come apart. Under BellSouth's collocation requirement, BellSouth loops that are recombined with BellSouth switching will require an absolute minimum of four points of failure, and could require up to 8 or more such points depending on whether an intermediate frame is used to reach a CLEC's collocation space. Thus, the collocation requirement at least doubles the possibility that CLEC loops will fail.

79. In addition, the potential for human errors that occur in customer installations will at least double. In addition to the "ordinary work" (associated with basic unbundled loop provisioning) of directing a loop to the correct tie cable corresponding to the CLEC's collocation equipment, technicians must also connect the CLEC's return tie cable to the correct terminals on the MDF block that corresponds to the correct switch port. Thus, technicians will have to perform twice the amount of work for CLEC customers.

80. Further, when there is trouble on a circuit, CLECs and ILECs will have to coordinate efforts to determine whether the source of failure is in the collocated space, the ILEC tie pairs, the jumpers, or the MDF. This process will become even more difficult over time, as inevitable errors in recombination work cause incorrect disconnections and incorrect pairings of loop and switch ports. In contrast, when there is trouble on an ILEC customer's line, no such complicated coordinated effort is required.

81. The additional loop length that would result from BellSouth's collocation requirement may also degrade the quality of service and will require changes in the ILEC's records to reflect the changed characteristics of the loop. If the ILEC does not

make these changes, maintenance and repair functions cannot be properly performed. For example, changing the length of loops could have an impact on mechanized loop test (MLT) results, because when the make-up of a loop is changed (e.g., a change in loop length), the test could give improper results. Thus, the ILEC must reflect the change in its records to ensure that MLT results will be accurate.

82. BellSouth's collocation requirement puts unnecessary strain on often already congested frames and on delicate cross connection wiring, substantially increases the risk of human error and mechanical failure, and complicates central office maintenance and repair procedures. It thus needlessly raises the costs of providing local service and seriously hampers CLECs' ability to establish a reputation as reputable providers of local exchange service.

**D. Excessive Cost**

83. As shown above, the delay, disruption and discrimination inherent in manual loop/switch recombinations through collocation are themselves sufficient reasons for CLECs not to attempt to provide customers with UNE-based service. Nevertheless, there is an additional and important consideration -- cost -- that cannot be overlooked. AT&T's preliminary investigations confirm that a national entrant's incremental cost of manual recombination alone -- which, if BellSouth's approved rates in Louisiana are any guide, could, in the first year, be measured in the hundreds of millions or even billions of dollars on a national basis and easily exceed \$220 or more per customer -- would render large scale UNE-based service economically impractical.

84. Precise cost estimates in this context are, of course, hindered by the fact that the ILECs' manual recombination collocation schemes are of very recent vintage and largely undefined. In Louisiana, for example, the state commission approved BellSouth's proposal that it be allowed to price collocation "space preparation" -- a major category of "up-front" costs for which existing ILEC rates and proposals vary wildly -- on an "individual case basis" ("ICB").<sup>29</sup> Further, because many of the costs associated with manual recombination through collocation reflect upfront investments that must be incurred before a single customer is served, both estimating the size of the facilities to be installed and determining costs on a per customer basis require assumptions regarding the peak numbers of customers a CLEC could expect to acquire and serve, notwithstanding the enormous competitive advantages the collocation scheme provides to the ILEC.

85. Nonetheless, reasonable estimates of the likely magnitude of such costs are possible and more than adequate to demonstrate the enormous entry barriers that manual recombination through collocation would create. Based upon the best information currently available and using conservative assumptions, AT&T has estimated on the basis of BellSouth's Louisiana collocation rates three categories of relevant costs: (1) "upfront" costs, including site buildout and costs associated with pre-wired "connectivity" (*i.e.*, cabling, blocks, and frames) both inside the cage and from the cage to the point where cross-connects to the MDF will occur; (2) MDF manual cross-connects and related "customer

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<sup>29</sup> It should be noted that the Louisiana tariff and BellSouth's Collocation Draft Master Agreement conflict with regard to whether space preparation and cage construction are treated as recurring charges or one-time charges.

migration" costs incurred when the CLEC actually begins serving a customer; and (3) monthly recurring costs associated with operating and maintaining the collocation-related facilities. The results of this investigation, which by no means capture all of the costs an entrant would likely experience in the real world, vividly illustrate that the proposed collocation requirement would impose enormous costs upon new entrants that would be sufficient independently to foreclose use of combined elements for local entry for most if not all customers.<sup>30</sup>

86. Although I describe AT&T's preliminary analysis in greater detail below, a few of its results are worth noting at the outset. First, the upfront costs of the collocation space, equipment and the pre-wired connectivity necessary for a CLEC with a statewide offering to be ready to handle customers served by any and all of BellSouth's Louisiana central offices and remote switch locations could alone easily exceed \$45 million. Second, at the time of provisioning, the CLEC would incur approximately \$50 in cross-connect and related charges for each customer. Thus, even assuming away the severe limitations on provisioning described above and pretending that the CLEC could hope to acquire and serve 220,000 customers in the first year (approximately 10% of BellSouth's Louisiana base), that market "success" would come at a collocation cost of more than \$220/customer. Finally, each month AT&T would incur more than approximately \$1.40/customer in additional recurring collocation related costs. BellSouth, of course, would

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<sup>30</sup> In addition to the other assumptions noted below, this analysis is limited to costs that would arise from combining two elements -- the loop and switch elements. If CLECs were required to combine other elements, such as the loop and NID, they would bear even greater costs and disruptions.